

### **Abstract**

The present invention relates to a process for producing polyunsaturated fatty acids in an organism by introducing nucleic acids into said the organism which code for polypeptides having acyl-CoA:lysophospholipid a cyltransferase activity. Advantageously, these nucleic acid sequences may, if appropriate together with further nucleic acid sequences coding for biosynthesis polypeptides of the fatty acid or lipid metabolism, be expressed in the transgenic organism. The invention furthermore relates to the nucleic acid sequences, to nucleic acid constructs comprising the nucleic acid sequences of the invention, to vectors comprising said nucleic acid sequences and/or said nucleic acid constructs and to transgenic organisms comprising the abovementioned nucleic acid sequences, nucleic acid constructs and/or vectors. A further part of the invention relates to oils, lipids and/or fatty acids produced by the process of the invention and to their use.